CLAIMS

1. A method for processing surfaces of articles, comprising preparing a surface and applying a coating by accelerated particles, characterized in that the surface preparation and the application of coating are performed simultaneously by scanning the surface with separate two-phase flows.

2. The method of claim 1, characterized in that the surface scanning is performed with linear velocity of movement of the two-phase flow along the surface, preparing the surface, which is equal to the velocity of movement along the scanned surface of the two-phase flow applying coating.

3. The method of claim 2, characterized in that the linear velocity of movement of the two-phase flow is selected from the range between $V_{min}=0.7\times k\times L\times \eta$ and $V_{max}=1,2\times k\times L\times \eta$, where $k=g/m$ – ratio of the flow rate g of particles, used for surface preparation, to the mass m of surface layer being removed within the processed spot, L – longitudinal linear dimension of the two-phase flow spot at the processed surface, $\eta_{cr}=(L-6d)/L$ – the ratio of effective longitudinal linear dimension of this spot to its linear dimension, where d – maximum granulometric size of particles, used for surface preparation.

4. The method of claim 1, characterized in that the surface area being processed is isolated from the environment.

5. The method of claim 1, characterized in that residual powder suspension in gas and deposition products, which remain after surface processing, are removed from a zone being processed.

6. The method of claim 5, characterized in that the removed coating powder particles are reused.

7. The method of claim 5, characterized in that the particles used for surface preparation, after their removal and separation, are reused.

8. The method of claim 1, characterized in that a gas static pressure in the surface processing zone is made lower than the environmental static pressure.

9. The method of claim 1, characterized in that the main material of the surface being processed is exposed during surface preparation.

10. The method of claim 1, characterized in that the gas velocity in the two-phase flow, applying the coating, is greater than the sonic velocity in gas.

11. A method of surface preparation for subsequent application of coating, comprising processing of surface with particles, accelerated in a gas flow; characterized in that the preparation is performed by scanning the surface with a two-phase flow, wherein the gas flow velocity is selected from a range of velocities between 0.5 M and 1.2M, where M – Mach's number, granulometric size of particles is selected from a range between 300 micron and 500 micron, linear velocity of movement of a spot of accelerated particles along the surface is selected from a range between $V_{min}=0.7\times k\times L\times\eta$ and $V_{max}=1.2\times k\times L\times\eta$, where k=g/m – the ratio of the flow rate g of particles, used for surface preparation, to the mass m of surface layer being removed within the spot being processed, L – longitudinal linear dimension of the two-phase flow spot on the surface being processed, $\eta=(L-4d)/L$ – the ratio of effective longitudinal linear dimension of this spot to its linear dimension, where d is the maximum granulometric size of particles used for surface preparation.

12. The method of claim 11, characterized in that accelerated particles have hardness at least 1.1 times greater than the hardness of the removed layer material.

13. The method of claim 11, characterized in that the outer layer is removed at the gas flow temperature from $0.5T_к$ to $1.2T_к$, where $T_к$ – the boiling point of liquid that wets the surface.

14. The method of claim 11, characterized in that the surface area being processed is isolated from the environment.

15. The method of claim 11, characterized in that a gas static pressure in the surface processing zone is made lower than the environmental static pressure.

16. The method of claim 1, characterized in that the main material of the surface being processed is exposed during surface preparation.

17. The method of claim 11, characterized in that the residual powder suspension in gas and removed layer materials, remaining after surface preparation, are removed from the surface preparation zone.

18. The method of claim 17, characterized in that the particles used for surface preparation, after removal and separation, are reused.

19. A system for processing surfaces of articles, comprising a spraying unit for application of coating, implemented as an accelerating supersonic nozzle with carrier gas supplier and a gas-powder mixture feeder to the spraying unit and to the metering feeder; characterized in that it has, additionally, a spraying unit for surface preparation for

subsequent application of coating, implemented also as an accelerating supersonic nozzle with a carrier gas supplier and a gas-powder mixture feeder to the spraying unit, and to a metering feeder; wherein each spraying unit is located in a separate chamber that has a socket for removal of particle suspension from the processing zone and a window located so that the nozzle axis line passes through the window area, and the spraying units are kinematically inter-connected.

20. The system of claim 19, characterized in that the chamber is manufactured of a gas-tight material.

21. The system of claim 19, characterized in that the chamber is covered with a sound-proof cover.

22. The system of claim 19, characterized in that the kinematical connection contains a fixing element.

23. The system of claim 19, characterized in that the kinematical connection contains an element for displacement of nozzles with respect to each other.

24. The system of claim 19, characterized in that the chamber is equipped with a sealing mechanism.

25. The system of claim 19, characterized in that the chamber is equipped with a mechanism for pressing the chamber against the surface of article.

26. The system of claim 19, characterized in that the chamber is equipped with a mechanism for moving the chamber along the surface of the article.

27. The system of claim 19, characterized in that chambers are manufactured with connected adjacent walls.